

Putting the results concisely, we get the following: While the mean figure for the neck is lower than that for the shaft, its variability figure is higher.

	Mean Figure.			Variability Figure.
Neck	2.24	10.4
Shaft	2.28	8.3

These results may be regarded as an experiment of Nature carried out during the lives of some 700 Egyptians. In every hundred of the 1,600 the variability figure of the neck (the point of special strain) is higher than that of other parts of the bone. The chances against such a relation being accidental are as 65,535 to 1.

What relation has such a discovery got with the cancer problem? Simply this, that the reactive transformative changes in cancer in some cases and the reactive difference in the variability figure of this bone—the femur—are both dependent on the identical antecedent factor—mechanical strain. As already stated for the case of the tongue, the sequence in cancer is—

Mechanical → Internal → Internal → Cancer.
strain strain change

The third factor—internal change—is unknown and is the heart of the cancer problem. The proposition now established for the hard tissues is—

Mechanical → Internal → Increased variability (that is,
strain strain increased divergence from
the mean or average towards
the extreme).

As there is no reason to suppose that the hard tissues should react to mechanical strain differently from the soft tissues merely because they contain a higher percentage of calcium, it is safe to conclude that any principle of tissue transformation established for the hard tissues will also hold good for the soft—for example, the tongue. Therefore, combining the above two propositions—the one for the soft tissues, the other for the hard—we get the following:

Mechanical → Internal → Increasing divergence → Cancer.
strain strain away from the average
and towards the ex-
treme

The figures above stated represent the end result of a research into the nature of the internal transformation changes of tissue. They are based upon 25,000 measurements and over 300 calculations. They establish a principle of the first magnitude in the cancer problem—namely:

There exists a relation between the strain to which a tissue is exposed and the extent to which that tissue varies.

This principle offers a rational explanation of the transformation of normal into cancerous tissue without it being necessary to think of any external cause for cancer whatsoever—for example, parasites. The above results indicate that cancer is explainable as an internal, compensatory, and essentially physiological tissue-change. If the above results be true then cancer is not infectious.

ELECTRARGOL IN SMALL-POX.*

BY

R. DENMAN, M.R.C.S.ENG., L.S.A.,

DIRECTOR, MEDICAL AND HEALTH DEPARTMENT, MAURITIUS.

THE following case is interesting not only for itself, but also for the events it led up to.

A young Mauritian creole was taken ill at the end of our last plague epidemic, early in March, 1913, and was removed to the lazaret for treatment. His case at the commencement was not normal, and twenty-four hours later he developed a rash which turned out to be small-pox. The diagnosis of plague was confirmed microscopic-

ally, and it was evident that the lad was suffering from the two diseases simultaneously.

On admission, he was given the routine treatment for plague—namely, intravenous injections of electrargol 10 c.cm. every twenty-four hours—and, as is not uncommon when the patient is treated early enough, the plague symptoms abated. It was noticed at the same time that the rash of the small-pox, which at the commencement looked as though it was going to be confluent, aborted. That on the forehead had already become papular, but got no further. The rash on the rest of the body did not become papular, and the destruction of skin was almost nil. The patient recovered, and was discharged cured within a month.

On talking the matter over with the medical officer in charge (Dr. Keisler) the question as to whether the plague made the small-pox abort or the small-pox the plague, or the electrargol both, was discussed, and we decided that it was worth while to give the electrargol a trial, and as small-pox has been in an epidemic form lately, we have had plenty of opportunities for doing so. We have had over 1,500 cases in the last five months, and we have tried the electrargol treatment on about 150 of them, choosing the confluent and haemorrhagic cases and leaving the milder ones to ordinary methods. The results have been most encouraging: if cases are treated before the full development of the rash, no matter how close the papules may be, they go no further. Those that have already begun to suppurate dry up. Those that have not yet suppurated do not do so, and those that are not yet papular remain simple maculae and fade away. The secondary fever does not appear, and the case takes a favourable turn after the first injection.

Some patients refused this treatment, so that we have been able to compare treated and untreated cases. The comparison has always been in favour of the treatment. The cases submitted to it have always made a more rapid recovery, been more free from complications, and recovered with little or no disfigurement, whereas those that have refused have had prolonged convalescence, frequently severe chest, kidney, or bowel complications, and if they recovered have been badly disfigured.

Of course success could not be expected in every case, and as the most severe were chosen for treatment we have had our failures; but even in the most severe haemorrhagic or septicaemic forms we have occasionally met with success, especially if we have been able to deal with them early enough; but as these, if untreated, rarely live for thirty-six hours after the first onset of the fever, they have to be caught very early for the treatment to be of any use.

Our epidemic is not yet over, owing to the difficulty we have experienced in getting the population revaccinated. We are geographically so situated that until we began making our own lymph we had to wait a whole month before we could get help from outside; but at last we are getting the epidemic under, and I hope in a few weeks to be able to follow this with a full report giving exact figures.

We have latterly increased the dose from 10 c.cm. to 20 c.cm., with marked success, and I recommend this treatment to others who are faced with a similar epidemic, and I give the following advice: Begin treatment as early as possible, give the injection intravenously, and give it at twenty-four-hour intervals for three or four consecutive days. Intravenous injection is difficult in children in any case, and more so when the skin is covered with a confluent small-pox eruption, but the treatment should be attempted in every case, and if intravenous injection is impossible an intramuscular one may be tried, though from our experience they are not very useful.

The virus of this epidemic has been very active; the percentage of confluent and haemorrhagic cases has been high and we have had several fatal cases in second attacks. We have had one second attack semi-confluent within two years of the last, and one patient readmitted to the lazaret twice in the same epidemic, the first attack semi-confluent and the second discrete.

Our death-rate for the whole epidemic has been less than 10 per cent., and for the cases treated—namely, all the cases worse than semi-confluent—about 20 per cent. Of the untreated semi-confluent and worse cases the death-rate has been nearly 50 per cent.

* Electrargol is a liquid preparation of colloidal silver, obtained electrically, as distinguished from the older preparations which were made by chemical reduction. It contains ultra-microscopic particles of metallic Ag in suspension, forming a colloidal solution. It is rendered stable by the addition of other colloids, so that it does not agglomerate on contact with electrolytes. It may be injected into the tissues without risk of local precipitation of metal in an inactive state.—*Year-book of Pharmacy*, 1912.